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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in and relating to Dish Washing Machines

5 We, ALBANO - ALBANO - MULLER and
ELEONORE VITS née MULLER, both of 1,
Lohestrasse, 583 Schwelm, Westphalia,
Federal German Republic, both German
citizens, trading as GRUNDSTUCHSVERWAL-
TUNGSGESELLSCHAFT MULLER & Co., K.G.
do hereby declare the invention, for which
10 we pray that a patent may be granted to us,
and the method by which it is to be per-
formed, to be particularly described in and
by the following statement:—

15 The present invention relates to dish wash-
ing machines having a washing device, for
example a water jet apparatus, arranged in
the bottom of the container.

20 Dish-washing machines are known in vari-
ous embodiments. Their construction consists
normally of a container for taking the dishes
to be washed, and of a washing device
arranged in the said container, which device
consists for example of a mechanically driven
vane system distributing the washing liquid
and throwing the same on to the dishes to
25 be washed, or of a self-driving reaction-jet
apparatus having a rotary nozzle body, from
which jets of the washing liquid emerge, on
trajectories fixed relative to said body. In
many cases a plurality of passages is required
30 in the bottom of the container, e.g. for the
driving shaft of the vane system, for the
supply of the washing liquid to the vane
system or to the reaction jet apparatus, res-
pectively, for the return of the washing liquid,
for the heating, for drainage apertures for
35 emptying the container and the like. The
invention has the object of simplifying this
arrangement.

40 A dish-washing machine according to the
invention has a container with a circular
aperture in its bottom with which a casing
is connected, in the centre of which a self-
driving rotary reaction nozzle system is
mounted on a wobble plate, while at its
bottom a sink water trap is provided, a

45 circulation pump being connected at its suc-
tion side with the said trap and at its pres-
sure side with the said rotary reaction nozzle
system, heating elements surrounding the
said rotary nozzle system being also arranged
50 in said casing.

55 In the cylindrical casing moreover the
heating device is accommodated, and accord-
ing to a preferred embodiment, surrounds the
washing device, for example in the form of
heating coils placed around the washing
60 device. In order to make sure that the heat-
ing is not switched on when there is no
water in the machine, it is proposed to
arrange a diaphragm pressure switch in the
wall of the sink water trap, which permits or
65 effects the switching on of the heating only
when a predetermined quantity of water is
in the machine and applies the required pres-
sure on the diaphragm pressure switch.

70 In detail, the construction according to the
invention may be developed and formed in
various ways. For example it may be ad-
vantageous to provide in the said water sink
trap a strainer basket which can be taken out,
dividing said water sink trap as it were in two
75 portions, namely an upper portion having
fine sieve apertures provided in the strainer
basket and in communication with the suc-
tion side of the circulation pump and con-
sequently straining the circulation of the
washing liquid, and a lower portion of the
said water sink trap, wherein the sieve has
substantially larger apertures and is in com-
80 munication with a draining pump through
which the washing liquid can be completely
removed from the container. Under the said
cylindrical casing moreover the driving motor
can be mounted for those washing devices
which are driven by a mechanical torque.

85 An advantage attained by the invention
consists in that with the dish-washing
machines according to the invention sub-
stantially only one bottom opening is re-

quired in the container bottom, into which the casing described is attached, wherein all the operative components are mounted. Thereby not only the construction is simplified, but also the assembly of the dish-washing machines according to the invention is facilitated. Another advantage is that the water jets of said reaction nozzle system mounted on a wobble plate can change their trajectories over a wide range of the dishes to be washed.

Hereinafter the invention will be explained in more detail with reference to the accompanying drawings illustrating an embodiment merely by way of example, and in which:—

Fig. 1 is a vertical section through the container of a dish-washing machine according to the invention,

Fig. 2 is a horizontal section on the line B—B of Fig. 1, and

Fig. 3 is a section on the line A—A of Fig. 1.

Fig. 4 shows the lower part of a modification of the embodiment according to Figs. 1—3, partly in section.

The structure of the washing machine illustrated in the drawing consists basically of the container 1 and of the washing device which is arranged within a circular aperture in the bottom of the said container. In the embodiment this washing device is constructed as a reaction nozzle system which will be described in more detail later.

The washing device with all accessories and additional components, which likewise will be explained hereinafter, is combined into a single aggregate, which latter is inserted as the bottom portion 3 into a corresponding bottom opening 4 of the container.

This connection is effected by means of flanges 33, 34, and a two-part ring 35, and sealed by means of sealing rings 36. This bottom portion 3 of the container consists

of a substantially cylindrical casing 5 wherein a reaction jet system 16 is mounted on a wobble plate 6, which is arranged above the cylindrical casing 5. Below the casing 5 there is arranged a water sink trap 7 and moreover the circulation pump 8, by means of which the washing liquid is circulated.

The same is in communication on the one hand with the water sink trap 7, and on the other hand with the reaction jet system 16. In the circular chamber 5 there are moreover arranged the heating coils 9 which surround the washing device. This heating device is controlled by a diaphragm pressure switch 10 which is arranged in the wall of the water

sink trap and makes sure that the heating can be switched on only or can remain switched on only when a predetermined quantity of liquid is contained in the container. In the water sink trap 7 there is moreover provided a strainer basket 11 which in

its upper portion has small sieve apertures 12, and in its lower portion has larger sieve apertures 13. Through the fine apertures of the strainer basket 11 the washing liquid is drawn off when circulated by the aid of the circulation pump 8. When the container 1 is to be emptied of the washing liquid, this is effected through the larger aperture 13 of the strainer basket 11 from the lower portion of the water sink trap through a draining pump 14 indicated in Fig. 4.

In detail the following is to be stated with reference to the embodiment illustrated in the Figures:—

The wobble plate 6 carries a nozzle body 15 having nozzle outlet orifices 16 in its top surface (not shown). Axially in the nozzle body 15 a duct 17 is arranged for the supply of the washing liquid to the nozzle outlet orifices 16, which duct is in communication with the outlet orifices 16 through a distributor changer 18. The outlet orifices 16 are so orientated that they apply a torque to the nozzle body 15 by hydraulic reaction so that the nozzle body performs a rotary movement, resting with its collar 20 on a race ring 19 and rolling on the same. Moreover the nozzle body 15 is put on top of a tubular connector socket not shown in the Figure, and is secured by the collar 20 also against being lifted off.

A diaphragm switch 10 has in the usual manner a diaphragm 22 exposed to the washing liquid in front of which there is a sieve 23 the diaphragm 22 controlling a micro switch 25 through a lever arm 24. This arrangement as a whole is retained by a lid 26, which is screwed on a corresponding port in the wall of the water sink trap 7.

The strainer basket 11 arranged in the water sink trap 7 is positioned in the water sink trap 7 by a shoulder arrangement 27, which also divides its upper portion from its lower portion for circulation and emptying respectively. By the aid of the loop 28 the strainer basket 11 can be easily lifted out of the water sink trap 7. In normal washing operation, as stated, the washing liquid is moved in the direction of the arrow 31 by the circulation pump 8, which pump is designed as a centrifugal pump and whose suction port 30 is connected through the sleeve 29 to the water sink trap 7, and said liquid is forced into the reaction nozzle system mounted on the wobble plate 6. The charging of the container 1 with a washing liquid may be effected through the connector nipple 32. When the container 1 is to be emptied completely, this is effected by drawing off the washing liquid from the lower portion of the water sink trap 7 through the draining pump 14.

An embodiment of this drawing pump is indicated in Fig. 4, which illustrates the lower part of a section corresponding to Fig.

its upper portion has small sieve apertures 12, and in its lower portion has larger sieve apertures 13. Through the fine apertures of the strainer basket 11 the washing liquid is drawn off when circulated by the aid of the circulation pump 8. When the container 1 is to be emptied of the washing liquid, this is effected through the larger aperture 13 of the strainer basket 11 from the lower portion of the water sink trap through a draining pump 14 indicated in Fig. 4.

In detail the following is to be stated with reference to the embodiment illustrated in the Figures:—

The wobble plate 6 carries a nozzle body 15 having nozzle outlet orifices 16 in its top surface (not shown). Axially in the nozzle body 15 a duct 17 is arranged for the supply of the washing liquid to the nozzle outlet orifices 16, which duct is in communication with the outlet orifices 16 through a distributor changer 18. The outlet orifices 16 are so orientated that they apply a torque to the nozzle body 15 by hydraulic reaction so that the nozzle body performs a rotary movement, resting with its collar 20 on a race ring 19 and rolling on the same. Moreover the nozzle body 15 is put on top of a tubular connector socket not shown in the Figure, and is secured by the collar 20 also against being lifted off.

A diaphragm switch 10 has in the usual manner a diaphragm 22 exposed to the washing liquid in front of which there is a sieve 23 the diaphragm 22 controlling a micro switch 25 through a lever arm 24. This arrangement as a whole is retained by a lid 26, which is screwed on a corresponding port in the wall of the water sink trap 7.

The strainer basket 11 arranged in the water sink trap 7 is positioned in the water sink trap 7 by a shoulder arrangement 27, which also divides its upper portion from its lower portion for circulation and emptying respectively. By the aid of the loop 28 the strainer basket 11 can be easily lifted out of the water sink trap 7. In normal washing operation, as stated, the washing liquid is moved in the direction of the arrow 31 by the circulation pump 8, which pump is designed as a centrifugal pump and whose suction port 30 is connected through the sleeve 29 to the water sink trap 7, and said liquid is forced into the reaction nozzle system mounted on the wobble plate 6. The charging of the container 1 with a washing liquid may be effected through the connector nipple 32. When the container 1 is to be emptied completely, this is effected by drawing off the washing liquid from the lower portion of the water sink trap 7 through the draining pump 14.

An embodiment of this drawing pump is indicated in Fig. 4, which illustrates the lower part of a section corresponding to Fig.

its upper portion has small sieve apertures 12, and in its lower portion has larger sieve apertures 13. Through the fine apertures of the strainer basket 11 the washing liquid is drawn off when circulated by the aid of the circulation pump 8. When the container 1 is to be emptied of the washing liquid, this is effected through the larger aperture 13 of the strainer basket 11 from the lower portion of the water sink trap through a draining pump 14 indicated in Fig. 4.

In detail the following is to be stated with reference to the embodiment illustrated in the Figures:—

The wobble plate 6 carries a nozzle body 15 having nozzle outlet orifices 16 in its top surface (not shown). Axially in the nozzle body 15 a duct 17 is arranged for the supply of the washing liquid to the nozzle outlet orifices 16, which duct is in communication with the outlet orifices 16 through a distributor changer 18. The outlet orifices 16 are so orientated that they apply a torque to the nozzle body 15 by hydraulic reaction so that the nozzle body performs a rotary movement, resting with its collar 20 on a race ring 19 and rolling on the same. Moreover the nozzle body 15 is put on top of a tubular connector socket not shown in the Figure, and is secured by the collar 20 also against being lifted off.

A diaphragm switch 10 has in the usual manner a diaphragm 22 exposed to the washing liquid in front of which there is a sieve 23 the diaphragm 22 controlling a micro switch 25 through a lever arm 24. This arrangement as a whole is retained by a lid 26, which is screwed on a corresponding port in the wall of the water sink trap 7.

The strainer basket 11 arranged in the water sink trap 7 is positioned in the water sink trap 7 by a shoulder arrangement 27, which also divides its upper portion from its lower portion for circulation and emptying respectively. By the aid of the loop 28 the strainer basket 11 can be easily lifted out of the water sink trap 7. In normal washing operation, as stated, the washing liquid is moved in the direction of the arrow 31 by the circulation pump 8, which pump is designed as a centrifugal pump and whose suction port 30 is connected through the sleeve 29 to the water sink trap 7, and said liquid is forced into the reaction nozzle system mounted on the wobble plate 6. The charging of the container 1 with a washing liquid may be effected through the connector nipple 32. When the container 1 is to be emptied completely, this is effected by drawing off the washing liquid from the lower portion of the water sink trap 7 through the draining pump 14.

An embodiment of this drawing pump is indicated in Fig. 4, which illustrates the lower part of a section corresponding to Fig.

its upper portion has small sieve apertures 12, and in its lower portion has larger sieve apertures 13. Through the fine apertures of the strainer basket 11 the washing liquid is drawn off when circulated by the aid of the circulation pump 8. When the container 1 is to be emptied of the washing liquid, this is effected through the larger aperture 13 of the strainer basket 11 from the lower portion of the water sink trap through a draining pump 14 indicated in Fig. 4.

In detail the following is to be stated with reference to the embodiment illustrated in the Figures:—

The wobble plate 6 carries a nozzle body 15 having nozzle outlet orifices 16 in its top surface (not shown). Axially in the nozzle body 15 a duct 17 is arranged for the supply of the washing liquid to the nozzle outlet orifices 16, which duct is in communication with the outlet orifices 16 through a distributor changer 18. The outlet orifices 16 are so orientated that they apply a torque to the nozzle body 15 by hydraulic reaction so that the nozzle body performs a rotary movement, resting with its collar 20 on a race ring 19 and rolling on the same. Moreover the nozzle body 15 is put on top of a tubular connector socket not shown in the Figure, and is secured by the collar 20 also against being lifted off.

A diaphragm switch 10 has in the usual manner a diaphragm 22 exposed to the washing liquid in front of which there is a sieve 23 the diaphragm 22 controlling a micro switch 25 through a lever arm 24. This arrangement as a whole is retained by a lid 26, which is screwed on a corresponding port in the wall of the water sink trap 7.

The strainer basket 11 arranged in the water sink trap 7 is positioned in the water sink trap 7 by a shoulder arrangement 27, which also divides its upper portion from its lower portion for circulation and emptying respectively. By the aid of the loop 28 the strainer basket 11 can be easily lifted out of the water sink trap 7. In normal washing operation, as stated, the washing liquid is moved in the direction of the arrow 31 by the circulation pump 8, which pump is designed as a centrifugal pump and whose suction port 30 is connected through the sleeve 29 to the water sink trap 7, and said liquid is forced into the reaction nozzle system mounted on the wobble plate 6. The charging of the container 1 with a washing liquid may be effected through the connector nipple 32. When the container 1 is to be emptied completely, this is effected by drawing off the washing liquid from the lower portion of the water sink trap 7 through the draining pump 14.

An embodiment of this drawing pump is indicated in Fig. 4, which illustrates the lower part of a section corresponding to Fig.

1. The draining pump 14 is directly connected to the water sink trap 7. One half of the pump is sealed by a round annular seal and directly connected to the casing, while
5 the second half of the pump with the motor attached to a flange and the impeller wheel mounted on the motor shaft can be taken off after unscrewing two nuts. This arrangement affords the possibility of making this motor
10 readily accessible after removing the front wall of the machine.

WHAT WE CLAIM IS:—

1. A dish washing machine having a container with a circular aperture in its bottom
15 with which a casing is connected, in the centre of which a self-driving rotary reaction nozzle system is mounted on a wobble plate, while at its bottom a sink water trap is provided, a circulation pump being connected at its suction side with the said trap
20 and at its pressure side with the said rotary reaction nozzle system, heating elements surrounding the said rotary nozzle system being also arranged in said casing.

25 2. A dish washing machine according to claim 1, wherein a diaphragm-actuated pres-

sure switch controlling the said heating elements is provided in the wall of the said trap.

3. A dish washing machine according to claim 1, wherein a strainer basket is removably mounted in the said sink water trap.

4. A dish washing machine according to claim 3, wherein the said strainer basket is divided into two portions, the upper one of which has comparatively narrow sieve meshes and is provided for the circulation of the rinsing liquid circulated by the said circulation pump, while the lower portion has comparatively large sieve meshes, the bottom
40 part of said sink water trap surrounding said lower portion being in communication with a draining pump.

5. A machine according to claim 1, substantially as herein described with reference to Figs. 1 to 3 of the accompanying drawings.

6. A machine according to claim 5, modified substantially as herein described with reference to Fig. 4 of the accompanying
50 drawings.

S. MITTLER,
Chartered Patent Agent.

Fig. 1

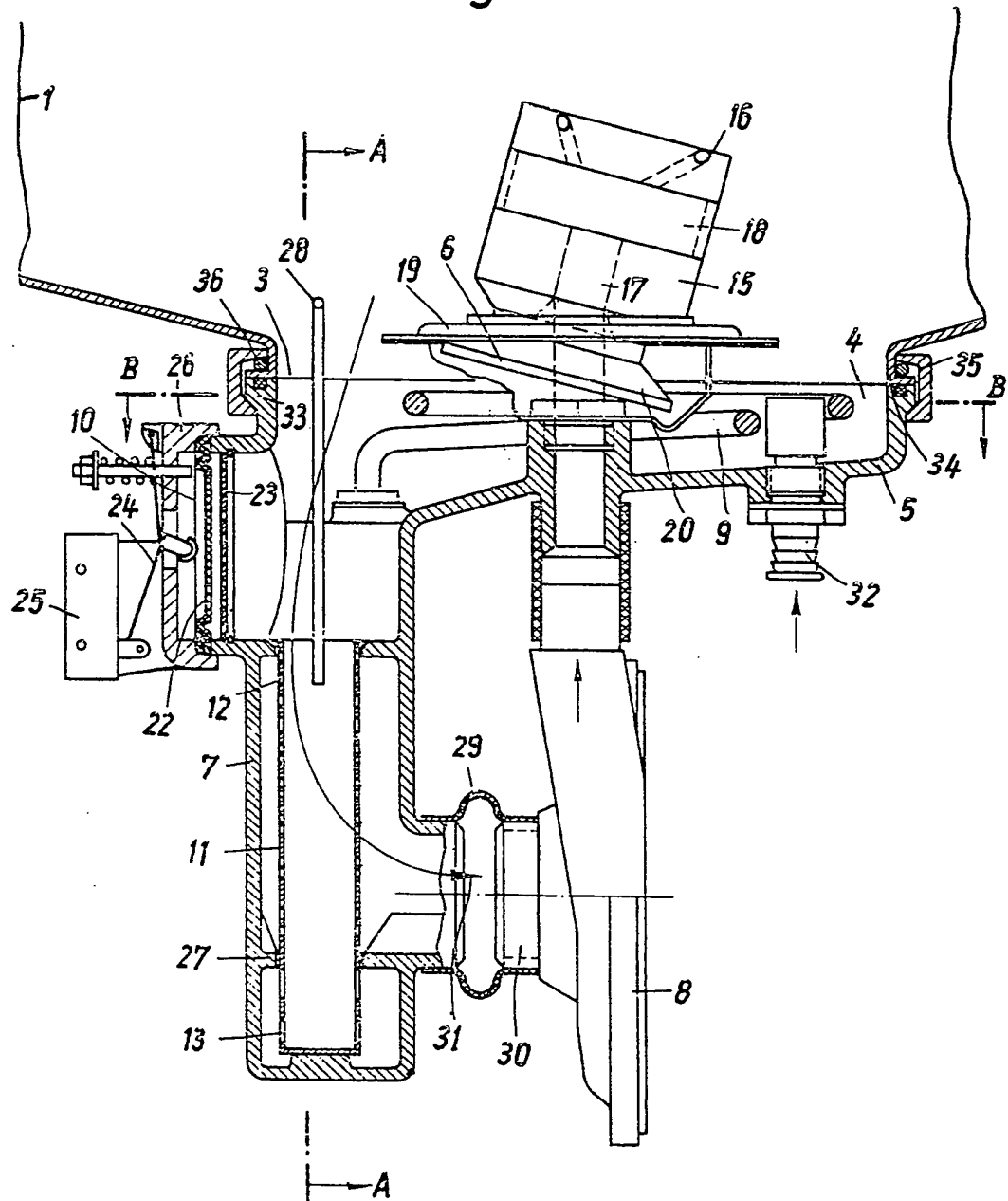
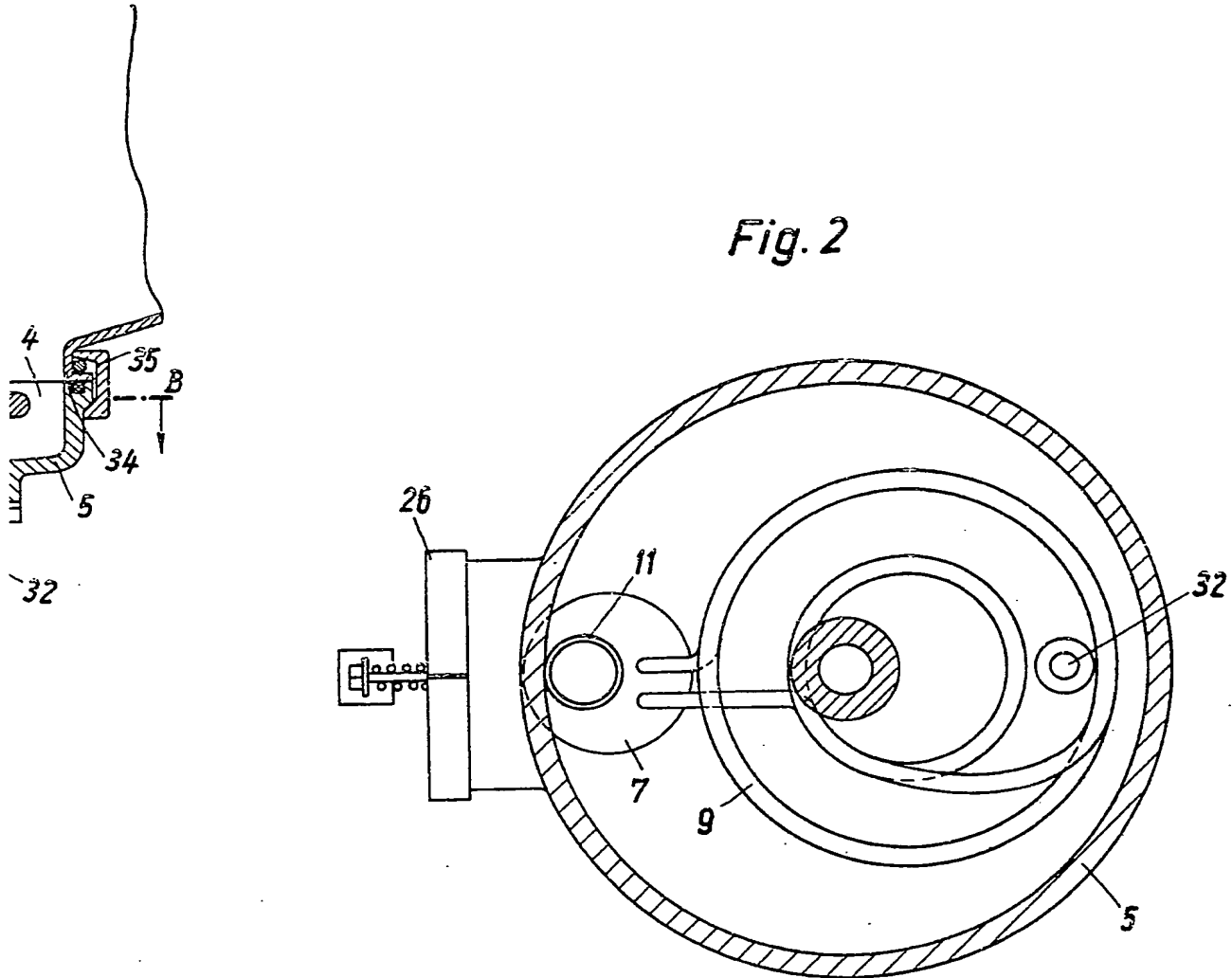


Fig. 2



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Fig. 1

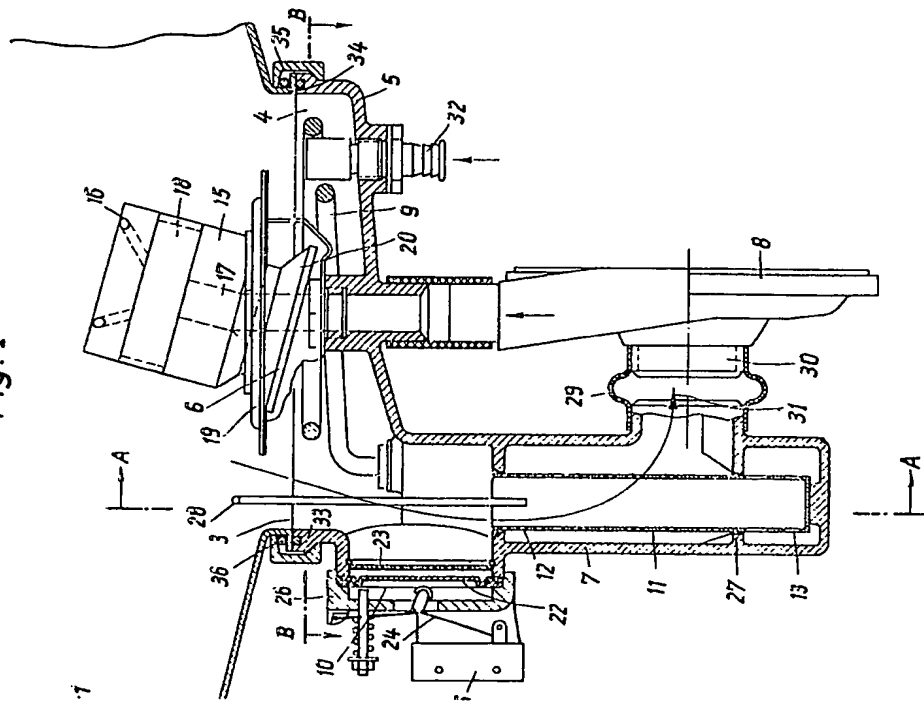


Fig. 2

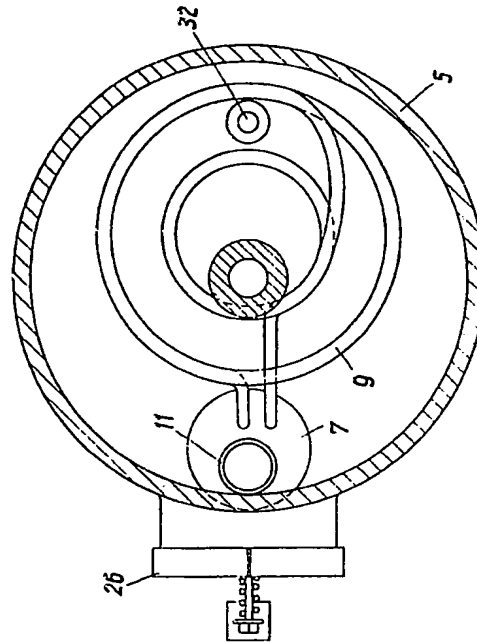
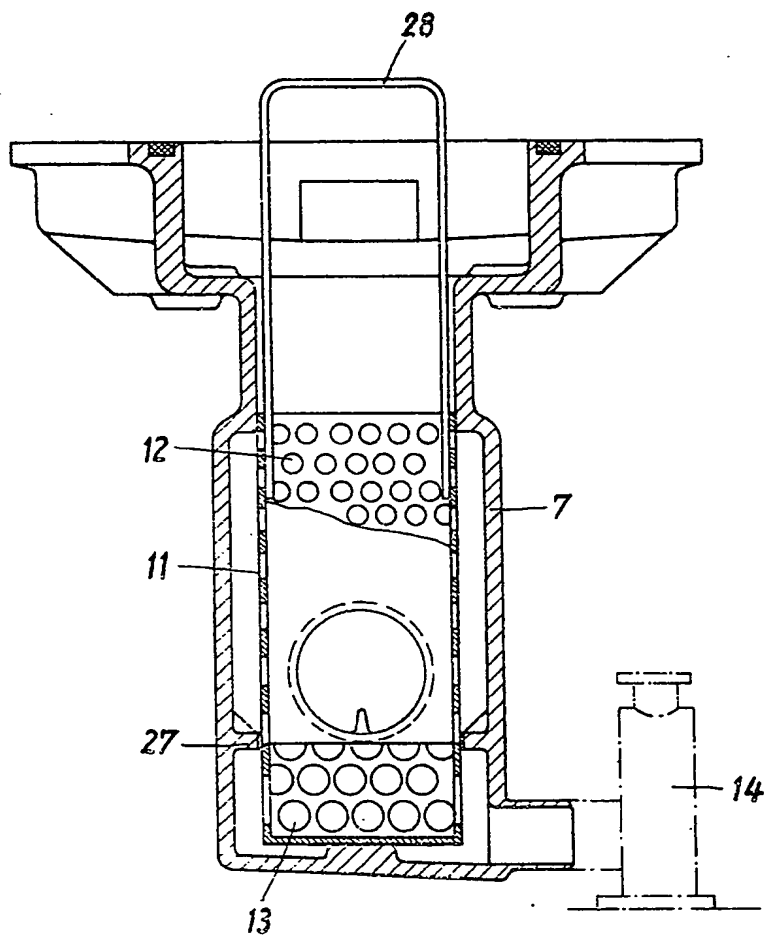


Fig. 3



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*This drawing is a reproduction of
the Original on a reduced scale.*
SHEETS 3 & 4

Fig. 4

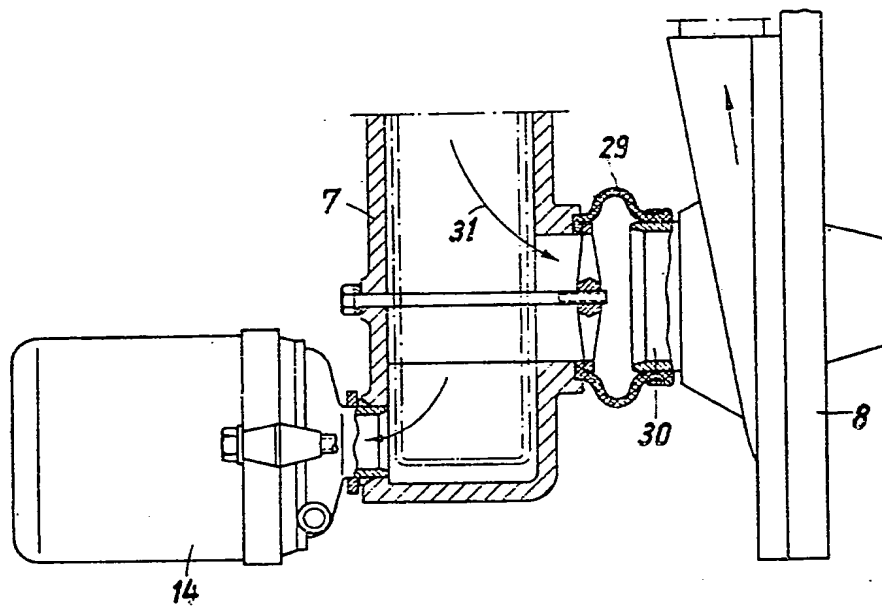


Fig. 3

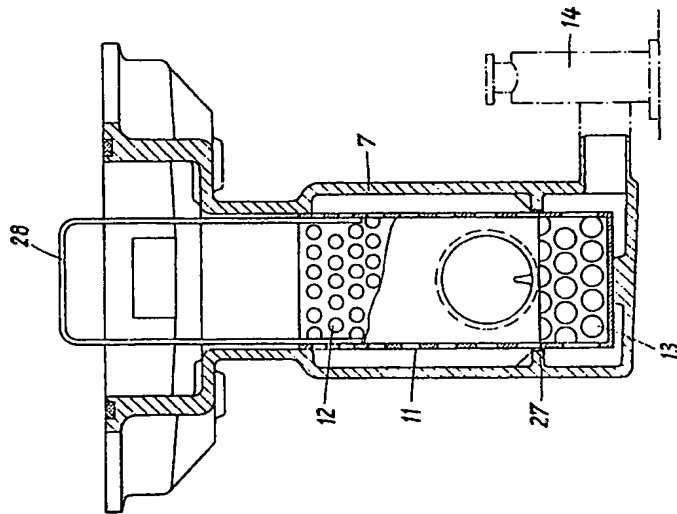


Fig. 4

